

REMARKS

I. Summary of Office Action

Claims 1-80 were pending in the application.

The Abstract was objected to for using implied language.

The Drawings were object to as lacking figure numbers.

Claims 1-2, 4, 6-10, 12, 18-25, 28-30, 32, 34-38, 40, 45-49, 52-55, 57, 59-60, 65, 70-74, and 77-80 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,310,883 to Clifton et al. (hereinafter, "Clifton").

Claims 3, 5, 11, 15-17, 31, 33, 39, 43-44, 56, 58, 61-64, and 68-69 were rejected under 35 U.S.C. §103(a) as being unpatentable over Clifton in view of U.S. Patent Application Publication No. 2002/0188592 to Leonhardt (hereinafter, "Leonhardt").

Claims 13-14, 41-42, and 66-67 were rejected under 35 U.S.C. §103(a) as being unpatentable over Clifton in view of U.S. Patent No. 4,310,883 to McMurdie (hereinafter, "McMurdie").

Claims 26, 50, and 75 were rejected under 35 U.S.C. §103(a) as being unpatentable over Clifton in view of U.S. Patent Publication No. 2003/0079084 to Gotoh (hereinafter, "Gotoh").

Claims 27, 51, and 76 were rejected under 35 U.S.C. §103(a) as being unpatentable over Clifton in view of U.S. Patent Publication No. 2003/0050729 to Basham (hereinafter, "Basham").

II. The Objections to the Abstract, Drawings, and Claim 29

The Abstract has been amended to overcome the Examiner's objection. Accordingly, Applicants respectfully request that the objection to the Abstract be withdrawn.

Replacements sheets for each of the figures is submitted herewith. Each figure is now labeled in correspondence with the description of the drawings on page five of the specification. Accordingly, Applicants respectfully request that the objections to the drawings be withdrawn.

Claim 29 was objected to for including unnecessary capitalization. The unnecessarily capitalized letter has been deleted. Accordingly, Applicants respectfully request that the objection to claim 29 be withdrawn.

III. The Incorrect Dates on an Information Disclosure Statement

Applicants thank the Examiner for alerting them that two of the documents cited in the IDS filed October 10, 2006 were listed with the incorrect publication date. Applicants file herewith a Supplemental IDS which lists the references with corrected dates.

IV. The Rejections Under 35 U.S.C. §112

Claims 78-70 were rejected under 35 U.S.C. §112, second paragraph. Applicant has canceled claims 78-80 and therefore respectfully submits that the rejections of those claims are moot.

V. The Rejections Under 35 U.S.C. §101

Claims 29-51 and 78-80 were rejected under 35 U.S.C. §101 as being directed to non-statutory subject matter.

Applicant has amended claim 29 and respectfully submits that claim 29, as well as claims 30-51, which depend from claim 29, are directed to statutory subject matter. Accordingly, Applicant respectfully requests the withdrawal of the rejections under 35 U.S.C. §101 to claims 29-51.

Applicant has canceled claims 78-80 and therefore respectfully submits that the rejections of those claims are moot.

VI. Amendments to the Claims and a Review of Some Embodiments

Amendments have been made to independent claims 1, 28, 29, 52, 54 and 77. The claims have been amended to clarify that the request for data storage is received from the application program itself, that the request is in respect of a 'data file' of application data, and specifies an expiry date for the data file. Support for the amendments can be found throughout the application, for example, on page 9, lines 23 to 30:

“When an Application Program 1 requires that a file be written to the storage means, it first makes a call, Step 41 to the Broker Application, via the Agent API 7. In making this call it preferably passes three parameters; the length of the file to be stored, the expiration date beyond which the file will no longer be required, namely ‘The Actual Expiry Date’ (or a null date indicating that the file is to be kept forever), and an indication of data content or data type”.

For the purpose of brief review, some embodiments of the disclosed subject matter provide the efficient usage of a plurality of storage devices to store data files received from a multitude of application programs for persistent data storage. As explained on page 4 of the application, persistent storage is “storage of data that once written is kept secure for an extended period of time.” Persistent data storage systems pose a number of specific problems. For example, in cases where there is a large quantity of transient data such as email or instant messages, demands on the write performance of the system are high in order to rapidly process the constant stream of incoming data. Furthermore, in order to store the large quantity of data for a long period of time, the storage space must be managed efficiently.

Some embodiments provide a solution to the above problems by requiring each application requesting storage to forward an expiration date for each data file (e.g., **claim 1 recites “a request from an application program for persistent storage of a data file of application data, the request including an expiry date, beyond which the data file is no longer required and may be deleted”**). Based on the expiration date forwarded by the application, a physical storage device is then chosen by the broker application for storage such that data files with similar expiration dates are stored together. This allows whole storage devices to be reclaimed or decommissioned when the expiration date has passed, allowing the system to be readily expanded or scaled back as demands for storage change. If more storage space is required, a new device can simply be added, and if data on an existing storage device has expired, the device can be reused or simply thrown away.

VII. The Rejections Under 35 U.S.C. §102 and the Independent Claims

Independent claims 1, 28, 29, 52, 54, and 77 were each rejected under 35 U.S.C. §102(b) as being anticipated by Clifton. As discussed above, amendments have been made to independent claims 1, 28, 29, 52, 54 and 77 to clarify that the request for data storage is received from the application program itself, that the request is in respect of a ‘data file’ of application data, and specifies an expiry date for the date file.

In contrast, Clifton is merely concerned with the storage of data sets, as discussed at column 3, lines 22 to 29: “There is a need to place multiple data sets into the mass storage system in an efficient manner even though each data set could have differing characteristics in terms of life, frequency and type of usage.” The system allocates data sets to volumes according

to their expiration date, but these expiration dates are, for example, (1) not notified by the applications requesting storage and (2) are **in respect of data sets, not data files**. As noted by Clifton “a data set may comprise only a portion of a volume or it may comprise a whole volume depending upon its size.” (Clifton, col. 9, ll. 8-10).

In each of claims 1, 28, 29, 52, 54, and 77, the expiration date is received from the application program itself and is for a file. This is significant as it allows data received from a large number of applications, to be allocated on a file-by-file basis to a respective storage device such that files with similar dates are grouped together. This is especially important for persistent storage system in which a large amount of data is to be stored for a long period of time, and it is important to optimize the storage so that memory is used efficiently. If the level of storage control allows only for the placement of data sets according to data set expiration dates, there will be files within the data sets which will have expired before the set, and which will then begin to take up space unnecessarily.

In particular, where messaging, email data or document data is to be stored, Clifton will become quickly inoperable as data sets do not readily exist in respect of messages or emails. Such files, will include vastly different expiration dates depending on when they were created or received, and the identity of the author for example.

Furthermore, by requiring the applications to provide the expiry date for each data file (**as is required by each independent claim**), high write performance of the system can be maintained, as a user is not required to enter an expiration date for each data file thus slowing the system down.


Accordingly, Applicants respectfully submit that claims 1, 28, 29, 52, 54 and 77 are allowable and respectfully request the withdrawal of the rejections to the same.

VIII. The Dependent Claims

Each of claims 2-27, 30-51, and 53 depends from one of claims 1, 28, 29, 52, 54 and 77 and is thus allowable for at least the same reasons as the claim from which it depends. Accordingly, Applicants respectfully request that the rejections to claims 2-27, 30-51, and 53 be withdrawn.

IX. The Granted United Kingdom Relative

For any use that it may be to the Examiner, Applicants note that United Kingdom Patent No. GB2405495B2 (the "GB relative") has been granted with essentially the same claims as the currently amended claims in this application and with the same art before the UK patent Office. Applicants include a copy of the GB relative in the IDS filed herewith. In addition, the cover sheet and claim 1 of the GB relative are reproduced below.

 UK Patent No. GB 2 405 495 B <small>REG. OFFICE OF PATENTS - 1998/1999</small>	
15a. Title of the Invention: Data storage system	
15b. IPC Class. (Main Class): G06F 11/00	
15c. Applicant: 15c.1. Name: IBM Corp. 15c.2. Address: Armonk, NY 10504, USA	15d. Inventor: 15d.1. Name: Peter W. Lee-Mullen 15d.2. Address: 100 The Strand, London, WC2R 2AL, United Kingdom
15e. Priority: 15e.1. Name: IBM Corp. 15e.2. Address: Armonk, NY 10504, USA	15f. Agent: 15f.1. Name: The Patent Office 15f.2. Address: 100 The Strand, London, WC2R 2AL, United Kingdom
15g. Filing Date: 15g.1. Name: IBM Corp. 15g.2. Address: Armonk, NY 10504, USA	15h. Filing Date: 15h.1. Name: The Patent Office 15h.2. Address: 100 The Strand, London, WC2R 2AL, United Kingdom

1. A method of operating a data processing system, the system comprising one or more application programs requiring persistent data storage for data files of application data, a plurality of storage devices each accessible via a computer network to one or more computers executing the application programs, and a broker program, wherein the method comprises:

receiving, by means of the broker program, a request from an application program for storage of a data file of application data, the request including an expiry date, beyond which the data file is no longer required and may be deleted; and

selecting for the data file which of the storage devices will be used to store the data file in accordance with the characteristics of the application data to be stored, including the expiry date, and the state of the storage devices.

Conclusion

Applicant respectfully submits that, as described above, the cited prior art does not show or suggest the combination of features recited in the claims. Applicant does not concede that the cited prior art shows any of the elements recited in the claims. However, to the extent Applicant has discussed specific elements of the claims, Applicant has merely provided examples of elements in the claims that are clearly not present in the cited prior art.

Applicant strongly emphasize that one reviewing the prosecution history should not interpret any of the examples Applicant has described herein in connection with distinguishing over the prior art as limiting to those specific features in isolation. Rather, Applicant asserts that it is the combination of elements recited in each of the claims, when each claim is interpreted as a whole, which is patentable. Applicant has emphasized certain features in the claims as clearly not present in the cited references, as discussed above. However, Applicant does not concede that other features in the claims are found in the prior art. Rather, for the sake of simplicity, Applicant is providing examples of why the claims described above are distinguishable over the cited prior art.

Applicant wishes to clarify for the record, if necessary, that the claims have been amended to expedite prosecution and/or explicitly recite that which is already present within the claims as interpreted in view of the specification. Moreover, Applicant reserves the right to pursue the original and/or complimentary subject matter recited in the present claims in a continuation application.

Any claims that have been cancelled are hereby cancelled without prejudice or disclaimer, and Applicant reserves the right to further prosecute these claims in continuing applications. In addition, Applicant has attempted to claim all embodiments disclosed in the present application, and no disclaimer of any embodiments is hereby intended by the presently pending claims.

Any narrowing amendments made to the claims, if any, in the present Amendment are not to be construed as a surrender of any subject matter between the original claims and the

present claims; rather merely Applicant's best attempt at providing one or more definitions of what the Applicant believes to be suitable patent protection. In addition, the present claims provide the intended scope of protection that Applicant is seeking for this application. Therefore, no estoppel should be presumed, and Applicant's claims are intended to include a scope of protection under the Doctrine of Equivalents and/or statutory equivalents, i.e., all equivalents that are substantially the same as the presently claimed invention.

Applicant also traverses any "Official Notice," "Design Choice," "Admitted Prior Art" or other alleged prior art that the Examiner purports is well known with respect to the claimed combination of the present invention. Applicants disagree and request the Examiner to provide a prior art reference describing any of these features that the Examiner has not provided a prior art reference or an affidavit under 37 C.F.R. Section 1.104(d)(2) providing details of why it would have been obvious. In the absence of either, Applicant requests withdrawal of this rejection for these reasons as well.

For all the reasons advanced above, Applicants respectfully submit that the rejections have been overcome and should be withdrawn.

For all the reasons advanced above, Applicant respectfully submits that the Application is in condition for allowance, and that such action is earnestly solicited.

Authorization

The Commissioner is hereby authorized to charge any additional fees, which may be required for this Amendment, or credit any overpayment to Deposit Account No. 08-0219

In the event that an Extension of Time is required, or which may be required in addition to that requested in a petition for an Extension of Time, the Commissioner is requested to grant a petition for that Extension of Time which is required to make this response timely and is hereby authorized to charge any fee for such an Extension of Time or credit any overpayment for an Extension of Time to Deposit Account No. 08-0219.

Respectfully submitted,

Dated: October 14, 2008

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